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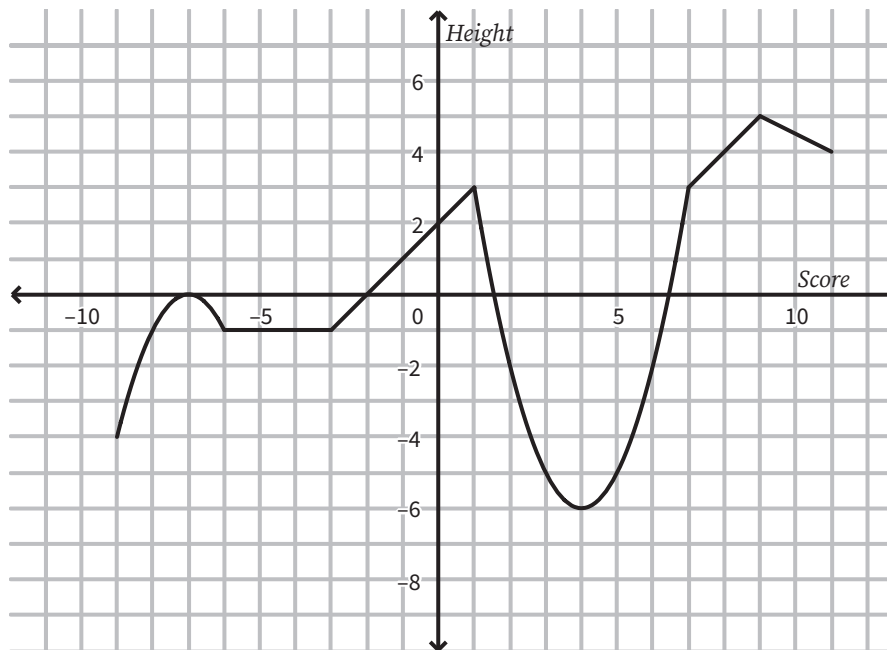
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Unit 3 Assessment

Use the graph for problems 1–8. The new Mariel Sisters video game has a game character that jumps and dives from one object to another during the game. Sometimes the character is above the ground and sometimes below. Points are added and subtracted throughout the game so that a player may have a negative score. This graph represents the height of the video game character for a given score during one game.



1. Write the domain for the function.
2. Identify the coordinates of the minimum.
3. Identify the coordinates of the maximum.
4. Identify the range of the function.



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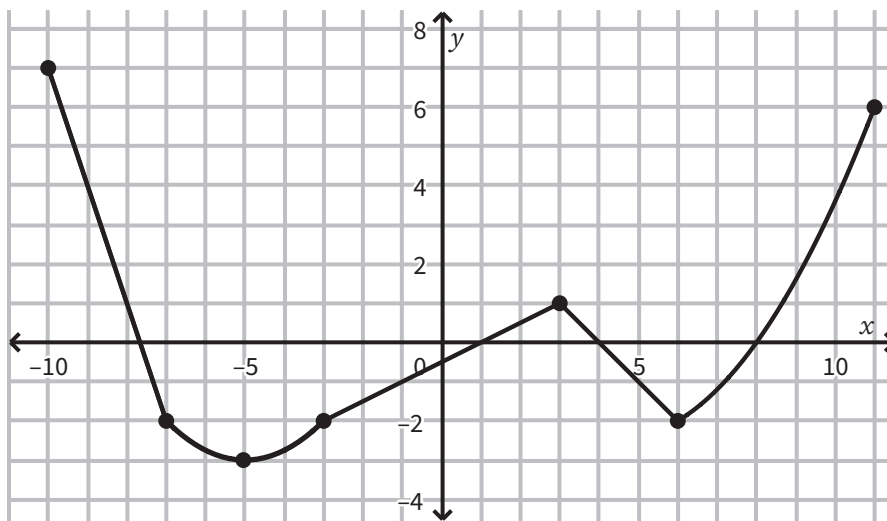
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5. Identify an interval where the function is increasing.
6. Identify the coordinates of the y -intercept.
7. Identify the coordinates of an x -intercept.
8. Identify an interval where the function is decreasing.
9. Identify an interval where the function is considered constant.



Use this graph of $f(x)$ for problems 10–13.



10. $f(6) =$ _____



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11. $f(3) =$ _____

12. If $f(x) = -3$, then,
 $x =$ _____

13. If $f(x) = 7$, then,
 $x =$ _____



Use this situation for problems 14–17.

A river in one part of the Rocky Mountains has a flow rate of 250 cubic meters of water per second. The flow of the water can be modeled mathematically with the function, $w(t) = 250t$, where $w(t)$ represents the volume of the water in cubic meters, at time t , in seconds.

14. Find $w(30)$ and explain what it means in this situation.

15. What would $w(t) = 3,250$ mean in this situation?

16. Find the number of cubic meters of water that have flowed down the river in 5 minutes.



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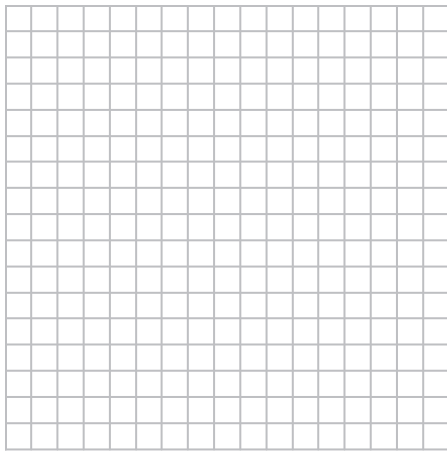
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17. How long will it take for 100,000 cubic meters of water to flow down the river?

18. Sketch a graph of a function with these features:

- The function has three intervals on which it is increasing.
- The function has two intervals on which it is decreasing.
- The domain of the function is $[-5, 7]$.
- The function has a minimum value of 0.
- The function has a maximum value of 2.



Use this situation for problems 19–22.

Two siblings, Matthew and Katie, are working hard to save money to go on a summer trip with their family. Both started with some money, and they both have jobs where they are paid by the hour. The function that models Matthew's projected savings for the trip is $m(t) = 12.50t + 350$. The function that models Katie's projected savings for the trip is $k(t) = 10t + 425$.

19. What does $m(t) = k(t)$ mean in this context?



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- 20.** What does $m(t) + k(t)$ mean in this context?
- 21.** Find a new function rule, $f(t)$, that represents the amount of money Matthew and Katie raise together to contribute to the summer trip.
- 22.** What is the y -intercept of the new function, $f(t)$? What does this mean in terms of the context?